

STUDIES IN AMERICAN RUBIACEAE

2. AYUQUE, *BALMEA STORMAE*, AN ENDANGERED MEXICAN SPECIES¹

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It is difficult to establish the status of a continental tropical plant species as endangered, since the ranges of most of them are so inadequately known. The rubiaceous tree *Balmea stormae*, locally called *ayuque*, may conceivably be commoner than suspected in parts of Mexico as yet unstudied by botanists. However, one circumstance makes it likely that this species will soon become very rare in any place where it may be discovered. Due to its conical habit with pointed top when young, it is commonly cut and sold in markets in the Uruápan area as a Christmas tree. According to Miss Marian Storm, of Guadalajara, this use of *Balmea* arose when laws were enforced making it illegal to cut conifer saplings for this purpose.

Miss Storm, noted writer and poet who brought *ayuque* to the attention of Professor Maximino Martínez and for whom he named it, has, in a series of letters between the years 1965 and 1971, described the gradual disappearance of this plant from the *pedregales* or lava beds near Uruápan where she discovered it in 1941. There is an amusing account of *ayuque* and her adventures in bringing it to botanical notice in her charming book *Enjoying Uruápan* (1945; pp. 452-459) and a poem about it in her *Poems of Sun and Snow* (1955; p. 36).

It seems worthwhile to offer an account of the present status and knowledge of *Balmea stormae*, with the hope that Mexico, with its growing interest in conserving its natural resources, may afford this fine potential ornamental tree enough protection to enable it to survive and continue its role as a thing of beauty. Attempts are being made to bring it into cultivation. It might do well in warm temperate and subtropical rather dry regions.

Balmea, a monotypic genus of the *Cinchona* tribe of the Rubiaceae, is endemic to a few small areas in southern Mexico and Guatemala. It was first brought to the attention of the botanical public by Miss Storm although it had been collected as early as 1935 by George Hinton and had been given a manuscript name (as a *Randia*) on the basis of a 1939 Leavenworth and Hoogstraal collection sent to Paul C. Standley.

BALMEA Martínez, Bull. Torrey Bot. Club 69: 438-441, 1942; An. Inst. Biol. 13(1): 36-41, 1942.

This genus belongs to the group in Cinchonae characterized by the corolla contorted in bud, the circumscissile caducous calyx, and the elevated epi-

¹ The first article of this series was published in SIDA 2: 386-389, 1966.

SIDA 5(4): 268—270, 1974.

gynous disk in fruit. In habit *Balmea* is a tree, pyramidal or conic when young, irregular when older, with broad, cordate leaves, slender, usually several-times trichotomous cymes, and seeds with a wing surrounding the body and tapering at both ends. Its closest relative, *Cosmibuena*, has elongate, often bifid wings at each end of the seed. *Hillia*, likewise close, has a small wing at one end of the seed and a small tuft of hair at the other.

These seed differences are about the only tangible ones among the three genera. Otherwise *Balmea* is set off by a series of characters, any one of which would be regarded by itself as of scarcely specific importance. It differs essentially from *Hillia* only in its non-comose seeds (simply winged basally and apically, as in *Cinchona*, rather than with a conspicuous coma apically) and more superficially in its thinner much broader leaves with long sharply distinct petioles and in its pendent, usually much more complex inflorescences, those in *Hillia* being of 1 (often sessile) to 3 flowers. From *Cosmibuena*, *Balmea* differs in its pendent, more complex inflorescence, its red rather than white flowers, its broad, cordate, much more veiny leaves, and its never bifid seed wing.

In actuality the three genera could best be treated as one. I am deferring this reduction until all species of the three can be placed side-by-side to be certain that no significant breaks among them exist.

Martínez relates his genus also to *Blepharidium* Standl. This differs from the genera mentioned above in the aestivation of the four corolla lobes in bud, these being conspicuously overlapping but not contorted. The leaf venation is more pinnate with many more veins on a side. It is in this general affinity but related also to *Hintonia* and several other genera. On both ends the seeds have wings that are broadly obtuse or rounded and erose or tridentate at the tips.

BALMEA STORMAE Martínez, 1. c., figs. 1-6; 1. c., figs. 1-4.

Small tree or shrub 4-10 m, entirely glabrous, bark thin, wood fine grained, pale pinkish-cream; leaves suborbicular, somewhat broader distally, acuminate at apex, cordate to subcordate at base, with 4-6 principal veins of unequal strength on a side, these subopposite to alternate, more prominent beneath, blades up to 9 × 14 cm, 2-3.5 cm long, apparently leafless at time of fruiting (*McVaugh* 22704); stipules early caducous; cymes terminal, pendent, once to usually twice (rarely 3 times) trichotomous, often with 1-2 extra flowers at basal ramification, peduncle 3-7 cm long, caducous subulate bracts at ramifications, branches 1-2 cm long, pedicels 1-3.5 cm long, elongating and becoming recurved in fruit; flowers becoming very fragrant at night; calyx lobes 5, subequal or somewhat unequal, lanceolate, to 7-8 mm long, blunt, calyx caducous shortly after anthesis; corolla deep red to dark maroon, tubular, somewhat dilated distally, with 5 short recurved oval obtuse lobes, tube 20 to rarely 27 mm long, 5 mm wide at summit, on type collection notably marked with short white lines, lobes to 5 × 7 mm; anthers included, 5(-7), dorsifixed just below mouth of tube, broadly linear, divided at base; style 22-23 mm long, stigma somewhat enlarged, bifid, the blunt

lobes stigmatic on inside, disk (after corolla and other flower parts are shed), strongly elevated, conic, tipped with a short truncate style remnant, capsule oblong, 22–30 mm long, firm, dehiscing first septicidally, to the full length, then the disk loculicidally, the valves diverging somewhat, placentae lanceolate, fleshy, attached to septum, seeds reddish-tan, prominently winged, broadly lanceolate, (3)4–6 mm long, margins somewhat erose, one end narrowly acuminate, cellular reticulate, the other broader, acute to obtuse, cells arranged in a fan-like pattern, body of seed elliptic, 2 mm long.

The specific epithet has been spelled several ways, but the simple feminine ending used above was the way it was published originally. The English and Spanish versions of the original description were published almost simultaneously; I do not know which was first. The same ending was used in both publications.

Specimens examined: MEXICO. Temascaltepec: Nanchititla, 19 Jun 1935, *Hinton 7894* (US, 2 sheets, F); Michoacán: Palo Verde, near Uruápan, Sep 1941, *Storm* (US); Palo Verde, Pedregales de Jicalán, near Uruápan, summer 1941, *Storm* (US); Palo Verde, Pedregales de Jicatlán et San Pedro, near Uruápan, *Martínez 3400* (US); Palo Verde, near Uruápan, 20 (or 21) Sep 1941, *Martínez 3400* (MEXU; type, 2 sheets marked “tipo,” one selected and marked “lectotype” by F. R. Fosberg, 1972, because it is somewhat more complete; US, 2 sheets; F); same locality, *Martínez s. n.* (F, 2 sheets without original labels, but marked “Isotype” and, on Field Museum label, “México, M. Martínez, Rec. Jan. 1944,” probably duplicates of the type); Jicalán (as Jicatlán), near Uruápan, *Martínez 3400* (MEXU, 4 sheets; several gatherings made on different days were all numbered 3400); La Laguna entrada al cañon del Mal País, 15 Sep 1961, *Alonso & Ramírez* (MEXU), also 1961, *Ramírez & Alonso* (MEXU); N.W. Aguililla, 6–7 km S of Aseradero Dos Aguas, 2000 m, 3 Mar 1965, *McVaugh 22704* (ENCB) (fruiting twigs without leaves, both fruits and seeds longer than on type); 2 mi S of Uruápan, 5577 ft, 29 Jul 1941, *Leavenworth & Hoogstraal 1229* (F).

GUATEMALA. Dept. Huehuetenango: NW of Cuilco, 2/3 way up Cerro Chiquihui above Carrizal, tree 25 ft tall, 1350–2300 m, 17 Aug 1942, *Steyermark 50811* (US, F) (sterile but has the right leaves); Dept. Jalapa: Potrero Carrillo, 14 mi NE of Jalapa, 1500–1900 m, 11 Dec 1939 *Steyermark 33056* (US, F) (Epiphyte with branches fleshy, leaves not or scarcely cordate on US sheet, cordate and normal for species on F sheet; stipules ovate); Dept. Zacapa: San Lorenzo, Sierra de las Minas, shrub 10 ft tall, 1600 m, 24 Jan 1942, *Steyermark 43177* (F).